

CLAIMS

What is claimed is:

1. A variable capacity rotary compressor comprising:
 - a housing defined therein with first and second compressing chambers having different volumes;
 - a rotating shaft adapted to rotate in the first and second compressing chambers;
 - a compressing unit arranged in the first and second compressing chambers, and adapted to perform a compression operation in a selected one of the first and second compressing chambers in accordance with a change of a rotating direction of the rotating shaft; and
 - a drive motor adapted to rotate the rotating shaft in a first direction or in a second direction, the drive motor being variable in rotating speed in accordance with an electrical control operation.
- 15 2. The variable capacity rotary compressor according to claim 1, wherein the compressing unit comprises:
 - first and second sleeves respectively arranged in the first and second compressing chambers;
 - first and second eccentric units mounted on the rotating shaft, and adapted to operate in opposite manners such that one of the first and second eccentric units selectively rotates an associated one of the first and second sleeves in an eccentric state in accordance with the rotating direction change of the rotating shaft, thereby causing the associated sleeve to perform a compression operation in an associated one of the first and second compressing chambers, while the other eccentric unit idly rotates the other sleeve associated therewith in the other compressing chamber associated therewith during the compression operation caused by the one eccentric unit; and
 - first and second vanes respectively arranged in the first and second

compressing chambers to be radially movable between extended positions thereof and retracted positions thereof.

3. The variable capacity rotary compressor according to claim 3, wherein the drive motor is a brushless DC motor.

5 4. The variable capacity rotary compressor according to claim 1, wherein the drive motor is an inverter motor.

5. The variable capacity rotary compressor according to claim 2, wherein:
the first eccentric unit comprises a first eccentric cam fixedly fitted around an outer surface of the rotating shaft in the first compressing chamber, and a first eccentric bush rotatably fitted around an outer surface of the first eccentric cam;

10 the second eccentric unit comprises a second eccentric cam fixedly fitted around the outer surface of the rotating shaft in the second compressing chamber, and a second eccentric bush rotatably fitted around an outer surface of the second eccentric cam; and

15 the compressing unit further comprises a locking unit adapted to lock the first and second eccentric bushes in opposite states in accordance with the rotating direction change of the rotating shaft such that one of the first and second eccentric bushes is locked in an eccentric state, while the other eccentric bush is locked in an eccentricity-released state.

20 6. The variable capacity rotary compressor according to claim 5, wherein:
the compressing unit further comprises a cylindrical connecting member adapted to connect the first and second eccentric bushes such that the first and second eccentric bushes have opposite eccentric directions; and

25 the locking unit comprises a locking slot provided at the connecting member to extend circumferentially, and a locking pin extending radially through the locking slot to be coupled to the rotating shaft such that the locking pin is engagable with the locking slot.

7. The variable capacity rotary compressor according to claim 5, wherein:
the first vane is arranged between suction and discharge ports of the first compressing chamber to be radially movable between an extended position thereof and a retracted position thereof while being in contact with an outer surface of the
5 first sleeve; and

the second vane is arranged between suction and discharge ports of the second compressing chamber to be radially movable between an extended position thereof and a retracted position thereof while being in contact with an outer surface of the second sleeve.

10 8. A variable capacity rotary compressor comprising:
a housing defined therein with first and second compressing chambers having different volumes;
a rotating shaft adapted to rotate in the first and second compressing chambers;
15 first and second sleeves respectively arranged in the first and second compressing chambers;
an eccentric unit mounted on the rotating shaft, and adapted to operate the first and second sleeves such that one of the first and second sleeves rotates in an eccentric state when the rotating shaft rotates in a first direction, thereby performing
20 a compression operation, while the other sleeve idly rotates during the compression operation, whereas, when the rotating shaft rotates in a second direction, the first and second sleeves perform operations opposite to the operations carried out when the rotating shaft rotates in the first direction, respectively; and
a drive motor adapted to rotate the rotating shaft in a first direction or in a
25 second direction, the drive motor being variable in rotating speed in accordance with an electrical control operation.

9. The variable capacity rotary compressor according to claim 8, wherein
the eccentric unit comprises:

first and second eccentric cams fixedly fitted around an outer surface of the
30 rotating shaft in the first and second compressing chambers, respectively;

- first and second eccentric bushes rotatably fitted around respective outer surfaces of the first and second eccentric cams; and
- a locking unit adapted to lock the first and second eccentric bushes in opposite states in accordance with a change of a rotating direction of the rotating shaft such that one of the first and second eccentric bushes is locked in an eccentric state, while the other eccentric bush is locked in an eccentricity-released state.

10. The variable capacity rotary compressor according to claim 8, wherein the eccentric unit further comprises:

- a first vane arranged between suction and discharge ports of the first compressing chamber to be radially movable between an extended position thereof and a retracted position thereof while being in contact with an outer surface of the first sleeve; and

- a second vane arranged between suction and discharge ports of the second compressing chamber to be radially movable between an extended position thereof and a retracted position thereof while being in contact with an outer surface of the second sleeve.

11. The variable capacity rotary compressor according to claim 8, wherein the drive motor is a brushless DC motor.

12. The variable capacity rotary compressor according to claim 8, wherein the drive motor is an inverter motor.